

# Resource Sharing Considerations of Implementing the Indian Ocean RAMA Moored Buoy Array



**Tropical Moored Buoy Implementation Panel  
Scottish Association for Marine Science  
Oban, Scotland  
26 September 2010**

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NOAA Climate Program Office



# NOAA's Goals For the Indian Ocean Region

- Working Closely With Regional Colleagues, NOAA Seeks to Build & Sustain Infrastructure to Provide Services to Benefit Society
  - » Observations
  - » Forecasts
  - » Scientific Collaboration
  - » Socio-Economic Capacity Building



# **Chronology Of NOAA's Participation in Indian Ocean Milestone Events**

- **First Session of the CLIVAR Asian-Australian Monsoon Panel – Goa India  
November 1996**
- **Sustained Observations for Climate of the Indian Ocean (SOCIO) - Perth,  
Australia November 2000**
- **Only Outside Indian Ocean Signatory of the IOGOOS MOU As an Associate  
Member - Grand Bay Mauritius 2002**
- **First Session of the CLIVAR/GOOS Indian Ocean Panel (IOP-1) - Pune India  
February 2004**
- **Deploys First Indian Ocean Mooring With India National Institute of  
Oceanography (NIO) - November 2004**

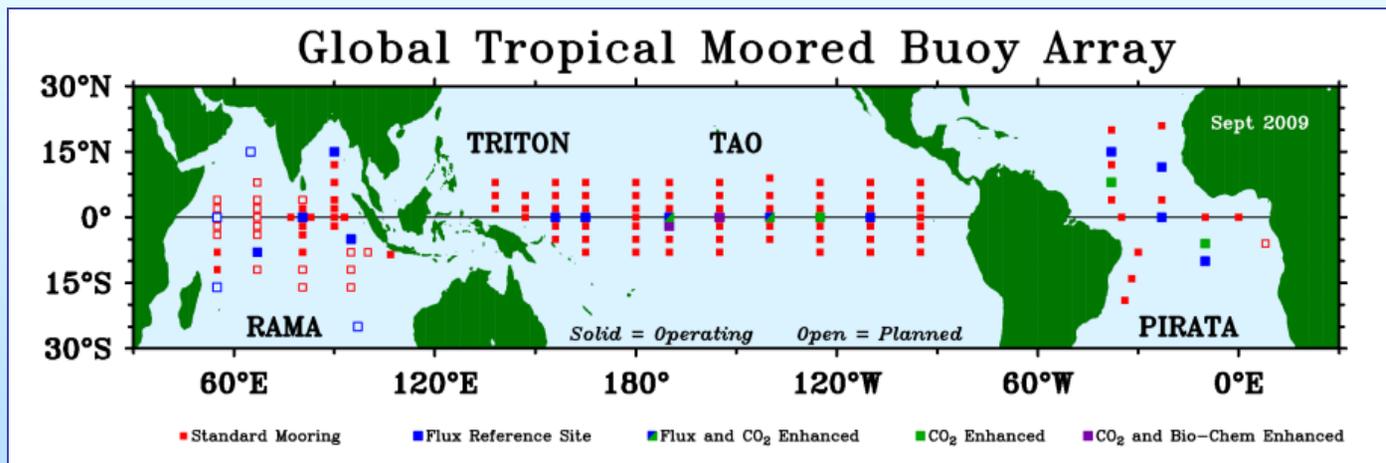
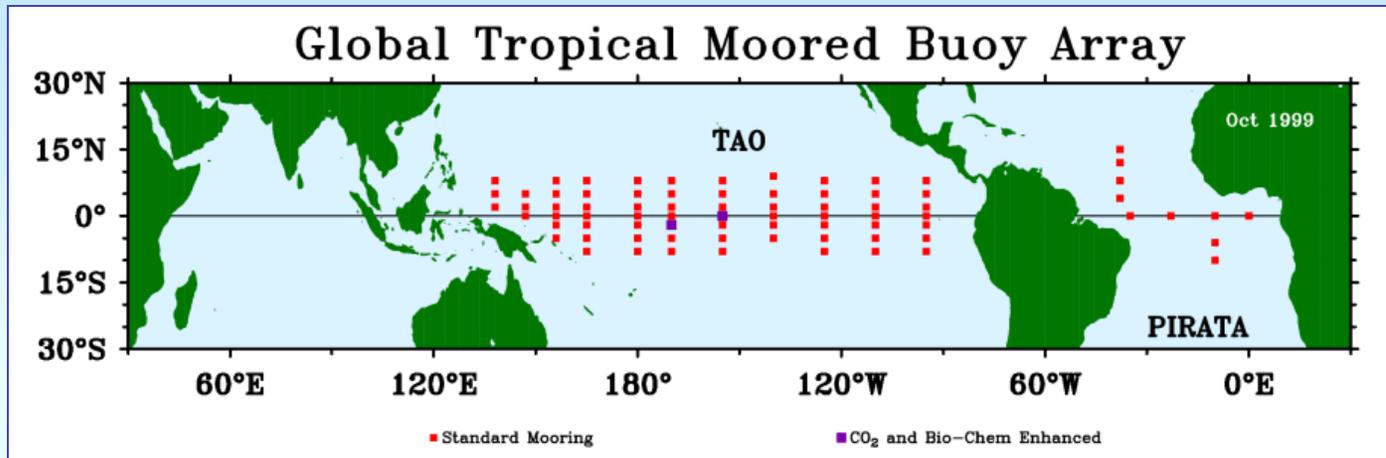


## **Chronology Of NOAA's Participation in Indian Ocean Milestone Events (continued)**

- **Participates in First High-Level Meeting to Review IOP Implementation Plan - Bali August 2005**
- **Participates in Second High-Level Meeting to Review IOP Implementation Plan - Phuket December 2007**
- **Signs Broad MOU & RAMA Agreement with India Ministry of Earth Sciences (MoES) - New Delhi April 2008**
- **Signs Two Agreements with Indonesia KKP & BPPT At World Ocean Conference - Manado Indonesia May 2009**
- **Western Indian Ocean Capacity Building Workshop With ASCLME – Capetown April 2010**



# Global and Indian Ocean Buoys 1999 → 2009



# International Cooperation For IndOOS and RAMA



*RV Baruna Jaya III  
Sept 2007*

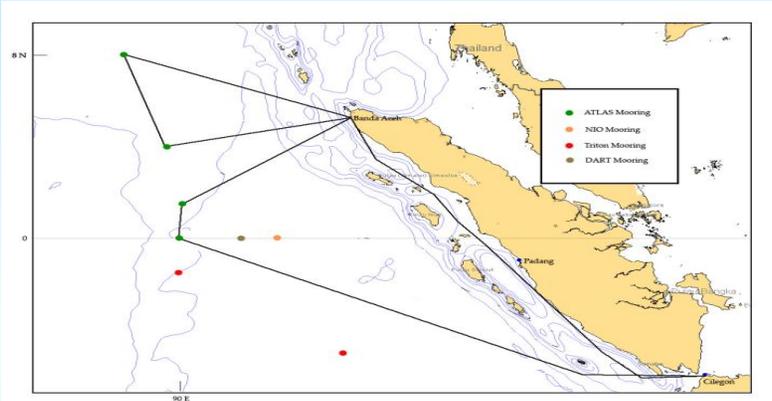


## Formal Bilateral Agreements Between NOAA and Agencies in:

- India - signed in 2008
- Japan - signed in 2008
- Indonesia - signed in 2009
- ASCLME (9 East African countries) -  
Planned in Spring 2011



## Indonesia Ministry of Marine Affairs and Fisheries (KKP) & Agency for Assessment and Application of Technology (BPPT)



- **June: 30 Day Baruna Jaya Cruise to Service 3 NOAA RAMA Moorings Off NW Sumatra**
- **September: 6<sup>th</sup> Capacity Building Workshop *Remote and In-situ Tools for Evaluating Climate Change Impacts, 7<sup>th</sup> Workshop Broader ASEAN***
- **September: BPPT Leadership Visit NOAA AOML/ NDBC to Discuss Indonesian GOOS (InaGOOS), RAMA, Drifters, Argo and Data Management**
- **March: PMEL Provides Two T-FLEX Packages for InaGOOS to BPPT 8S100E and 12S 95E**
- **May: BPPT Baruna Jaya Cruise Services Four (4) PMEL RAMA Moorings**



# India Ministry of Earth Sciences



- **Science Colloquium New Delhi September 2008**
  - *Research moored Array for African-Asian-Australian Monsoon Analysis and prediction (RAMA)*
  - *Climate Model and Ocean Assimilation Analyses for the Indian Ocean Region*
  - *Climate Monitoring and Prediction System for the South Asian Region*
  - *South Asian Regional Reanalysis (SARR)*
  
- **Pending Agreements**
  - *INSAT-3D Satellite Data*
  - *Carbon Cycle Greenhouse Gas Measurements and Research*
  - *Frame work for India–US Collaboration On Tropical Cyclone Research*
  - *Establish “Monsoon Desk” at NOAA’s Climate Prediction Center, Washington, DC*
  
- **August: NOAA Hosts Government of India Technical Team Visit to Advance Climate, Agriculture, Weather and Water Forecasting, Washington, DC**
  
- **6 October: Third MoES-NOAA Science Meeting, Washington DC**

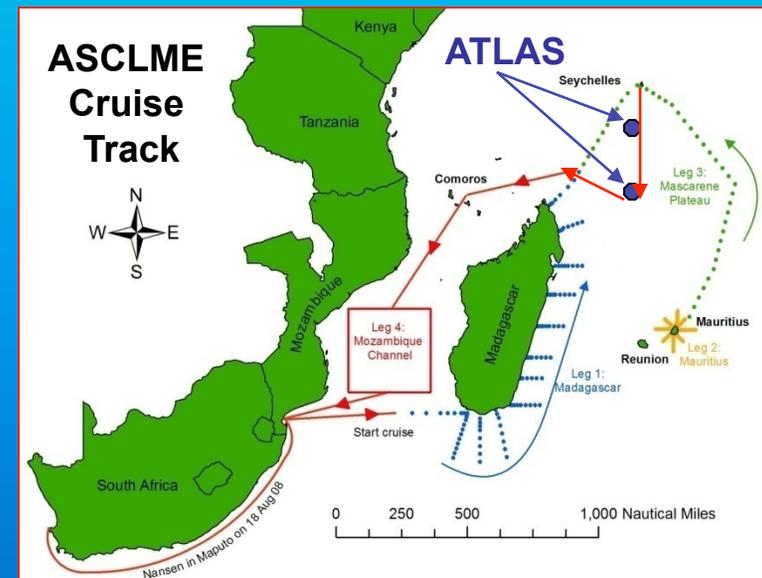
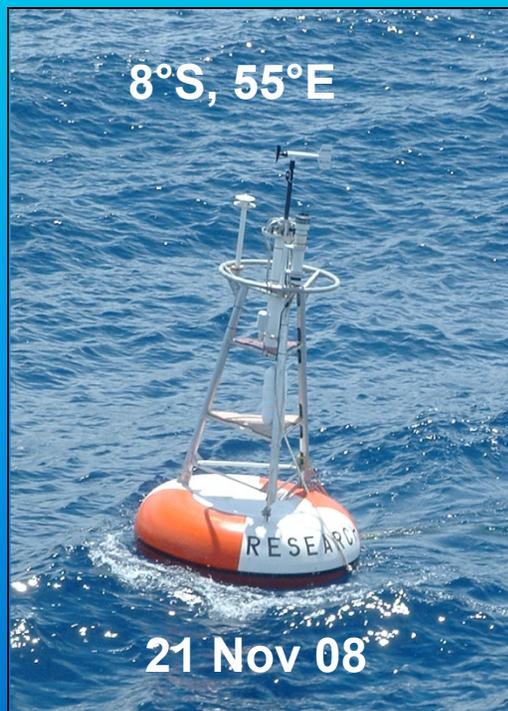




# Agulhas Somali Current Large Marine Ecosystems (ASCLME)



- 2 NOAA ATLAS and 4 Argo floats deployed during ASCLME cruise on *R/V Fridtjof Nansen* - Seychelles to Mozambique 18-27 Nov 2008
- Second Cruise Scheduled This October





IOC



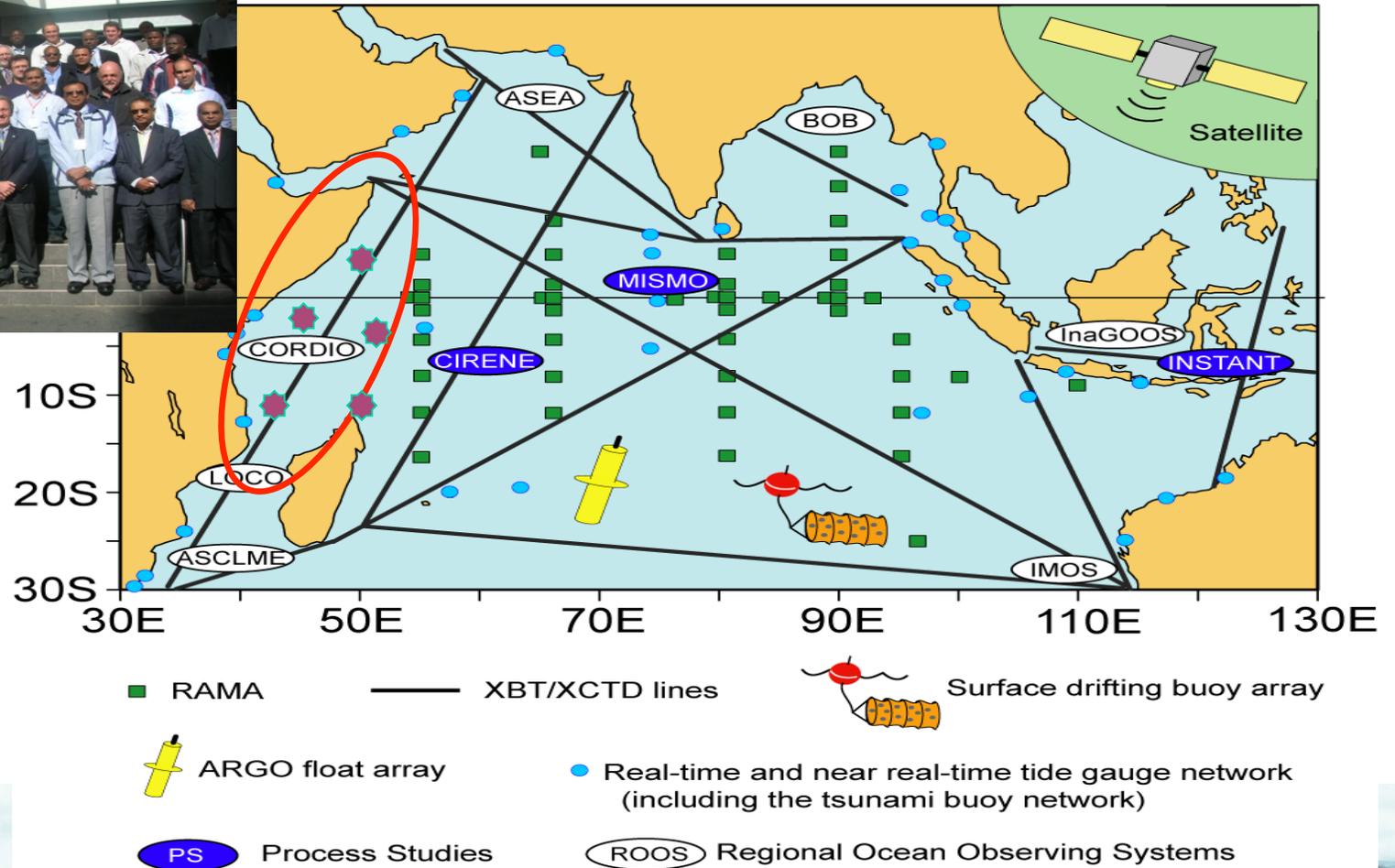
WMO

# Filling a major gap of IndOOS



✳ **Proposed moored buoys**

### Indian Ocean Observing System (IndOOS)



**Recommended by DBCP Capacity Building workshop for the Western Indian Ocean, Cape town, 19-23 April 2010**



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WMO

## Scientific Justification for enhancing observations in the western Indian Ocean

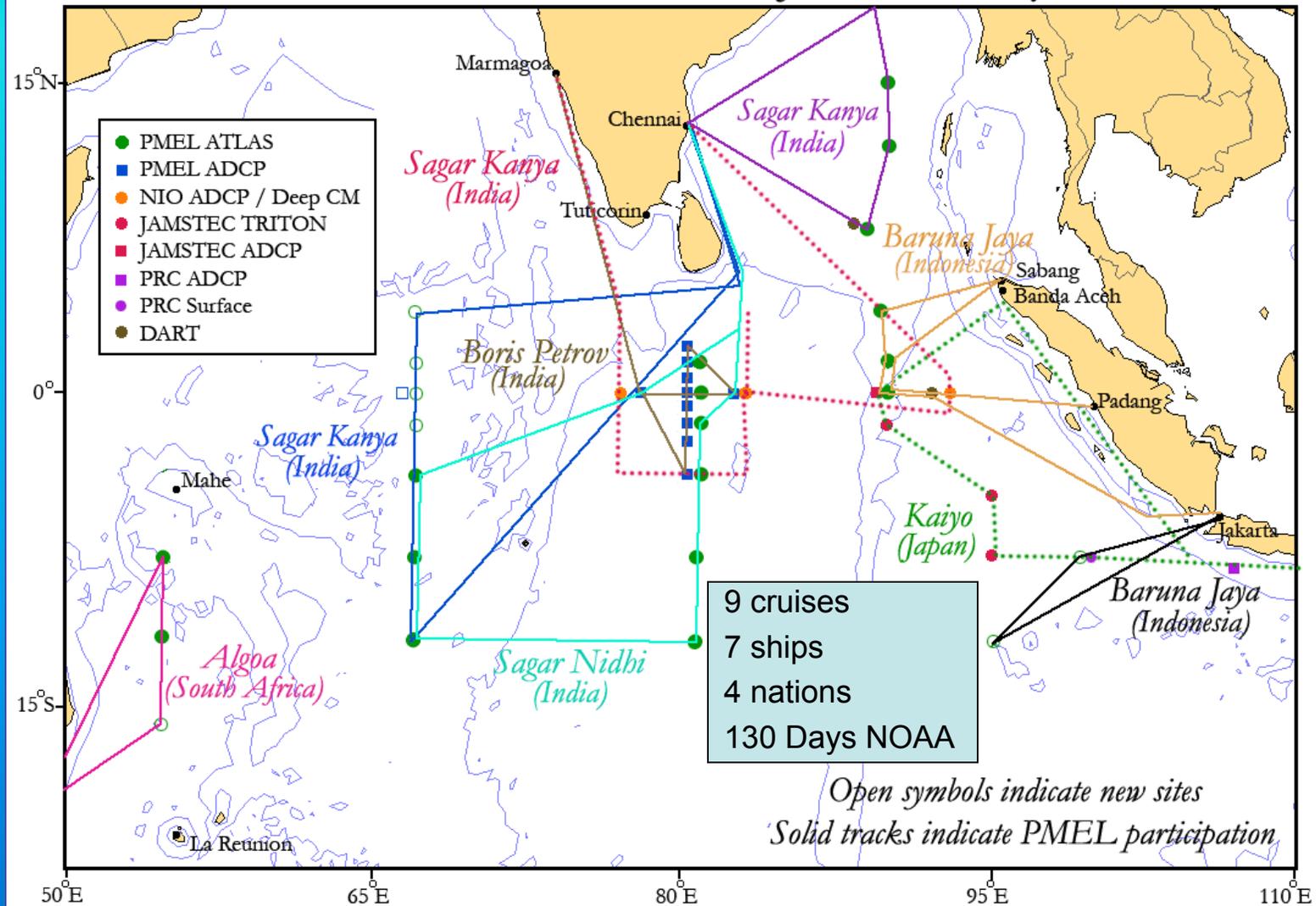


- Real-time Ocean observation to **calibrate/validate** both modeling and **satellites**
- Understand the evolution of surface pressure over the East African coast which have **high forecasting potential** for the WIO region
- Monitor **ocean atmosphere fluxes** and the Somali current “gyre” over the upwelling region of eastern African Coast
- Investigate the correlation between intra-seasonal **dry and wet spells** and the propagation of MJO oscillations
- Enhance the understanding of the **Indian Ocean Dipole**
- The need to improve coastal stations (tide gauge network) to study **sea level variations, sea level rise, storm surges, Tsunamis and climate change**

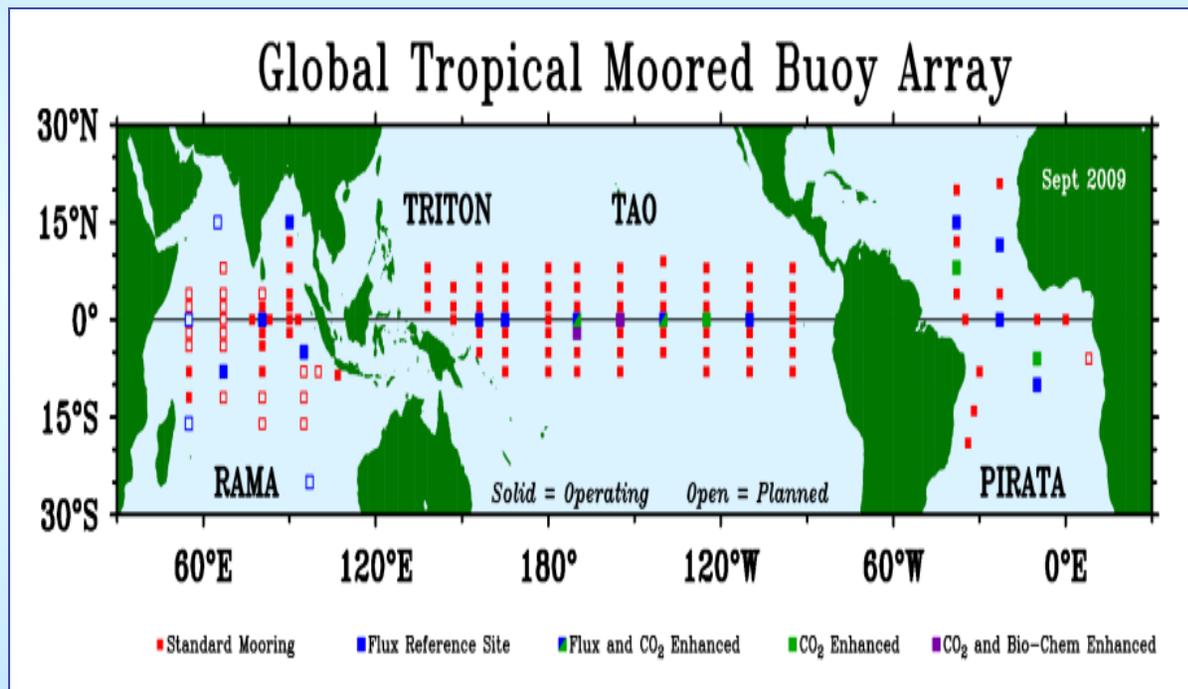


# RAMA Cruises June 2010-May 2011

Planned Indian Ocean Cruises Jun 2010 - May 2011



# Future Global Partnerships Under Development



- KORDI
- SOA/SIO
- Other?

A photograph of a research buoy on the ocean. The buoy is a red and white cylindrical float with the number '140' on its side. It has a metal ladder structure on top. Two people in blue work clothes and white hard hats are on the buoy. One person is standing on the ladder, and the other is higher up. The buoy is in the middle of the ocean. In the background, a large white ship is visible on the right side. The sky is blue with some clouds.

**Thank You**

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